Name _____

AP Bio Genetics Review

1. Axial flower position (A) is dominant over terminal flower position (a).
Two pea plants with axial flowers are crossed.
3/4 of the resulting offspring have axial flowers and 1/4 have terminal flowers.
What are the genotypes of the parents? Support your answer with a Punnett square.

2. In pea plants, tall (T) is dominant over short (t). In order to determine the genotype of a tall plant, you should cross it with a plant with what genotype and phenotype? Explain your answer.

3. A male heterozygous tall plant with terminal flowers is crossed with a female short plant that is heterozygous for axial flowers.
What percentage of the offspring will look like their father (tall and terminal)?
What percentage of the offspring will look like their mother (short and axial)?
Support your answer with a Punnett square.

4. How many different possible gametes can be produced by an individual with the genotype AABbccDdEEFfGGhhIi? Show your work.

5. If 2 individuals that are each heterozygous for 5 traits are crossed, what is the probability the offspring will be homozygous dominant for the first trait, heterozygous for the next three traits, and homozygous recessive for the last trait? Show your work.

6. Suppose that 500 red cattle were crossed with 500 white cattle and all of the resulting offspring were roan (red AND white). What type of inheritance is at work? If two of the roan offspring were crossed, what percentage of their offspring would you expect to be red vs white vs roan? Support your answer with a Punnett square.

7. When a red snapdragon is crossed with a white snapdragon, all of the resulting plants are pink. What type of inheritance is at work? What color flowers would you cross to end up with 50 percent white snapdragons and 50 percent pink snapdragons? Support your answer with a Punnett square.

8. A mother and her child both have type O blood. What are all of the possible blood types of the father? Explain your answer. Show support with Punnett squares.

9. Imagine you are a genetic counselor, and a couple planning to start a family comes to you for information because cystic fibrosis, an autosomal recessive disorder, runs in their families. Robert's father and brother have cystic fibrosis, but his mother does not. Sharon's sister has cystic fibrosis neither of her parents do. Neither Robert nor Sharon have cystic fibrosis themselves. What is the probability that Robert and Sharon will have a baby with cystic fibrosis? Explain how your determined your answer.

10. Albinism is also an autosomal recessive disorder. An albino woman marries a normally pigment man. The man's parents are also normally pigmented, but his brother is albino. The couple finds out they are going to have a baby boy. What is the probability that their son is albino? Surprise…they actually had twins! It turns out, their son was in fact albino. Now, what is the probability that the sister that is close on his heels is albino as well? Explain how you determined your answers.

11. A normal male and a female that is heterozygous for colorblindness are having a baby, but they don't find out the gender ahead of time. What is the probability they have a child who is a colorblind male? Support your answer with a Punnett square.

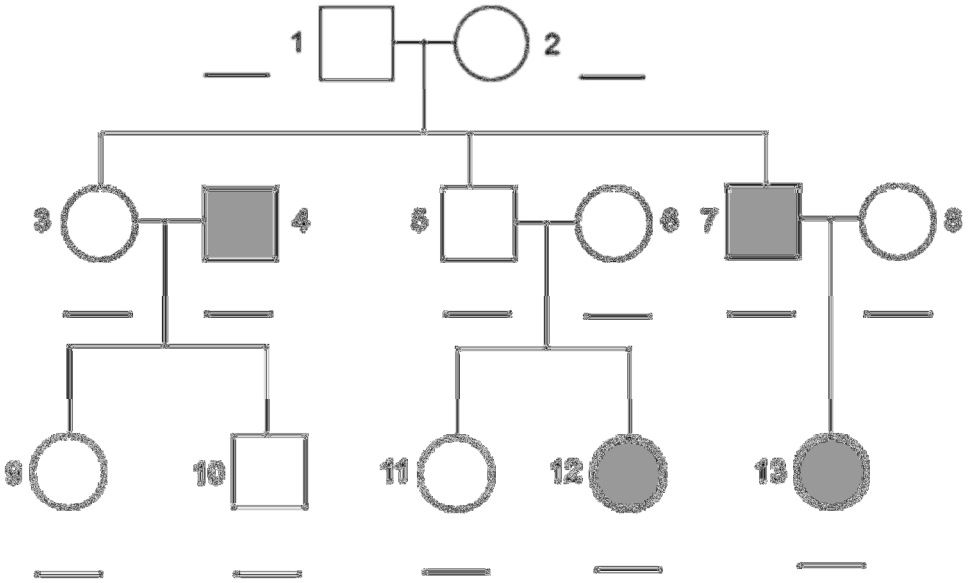
12. A male with hemophilia and a heterozygous normal female find out they are having a baby boy. What is the probability their son is normal? Support your answer with a Punnett square.

13. The following crossover frequencies were noted for a set of 4 genes on a single chromosome. Draw the most likely location of each gene on the "chromosome" below.

A and B → 15%
C and D → 20%
B and D → 30%
A an D → 45%
B and C → 10%

14. The pedigree below is most likely a pedigree of a condition of which type of inheritance? _____

Label the genotypes of each individual.



15. The pedigree below is most likely a pedigree of a condition of which type of inheritance? _____

Label the genotypes of each individual. (Assume individual #6 has the genotype X^HX^H)